

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Currently Amended) A system for detecting a target biological analyte, the system comprising:
 - a surface acoustic wave sensor comprising a detection surface;
 - a capture agent located on the detection surface, wherein the capture agent is capable of selectively attaching the target biological analyte to the detection surface;
 - a detection chamber located within an interior volume of a housing, the detection chamber comprising a volume defined by the detection surface and an opposing surface spaced apart from and facing the detection surface, wherein the opposing surface of the detection chamber comprises a flow front control feature that controls progression of a leading edge of a bolus of material moving across the detection surface; and
 - a waste chamber located within the interior volume of the housing, the waste chamber in fluid communication with the detection chamber;
 - ~~means for driving the shear horizontal surface acoustic wave sensor;~~
 - ~~means for analyzing data from the surface acoustic wave sensor to determine if target biological analyte is coupled to the capture agent.~~
2. (Original) A system according to claim 1, wherein the surface acoustic wave sensor comprises a shear horizontal surface acoustic wave sensor.
3. (Original) A system according to claim 1, wherein the flow front control feature comprises discrete structures protruding from and separated by a land area on the opposing surface of the detection chamber.

4. (Withdrawn) A system according to claim 1, wherein the flow front control feature comprises one or more channels in the opposing surface of detection chamber.
5. (Withdrawn) A system according to claim 1, wherein the flow front control feature comprises one or more regions of hydrophobic material occupying a portion of the opposing surface and one or more regions of hydrophilic material occupying a portion of the opposing surface.
6. (Original) A system according to claim 1, further comprising absorbent material located within the waste chamber.
7. (Currently Amended) A system according to claim 1, wherein the cartridge system further comprises capillary structure located between the detection chamber and the waste chamber.
8. (Original) A system according to claim 1, further comprising a vent that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere.
9. (Original) A system according to claim 8, further comprising a closure element operably attached to the vent.
10. (Original) A system according to claim 1, further comprising a fluid monitor operably connected to the housing, wherein liquid located within the interior volume of the housing can be sensed by the fluid monitor.
11. (Currently Amended) A system according to claim 1, further comprising a magnetic field generator capable of providing a magnetic field proximate to the detection surface.

12. (Currently Amended) A system according to claim 1, further comprising [[a]] one or more sealed modules, wherein each module of the one or more sealed modules comprises an exit port attached to the housing through one or more module ports that open into the interior volume of the housing, wherein at least one module of the one or more sealed modules contains a liquid isolated from the interior volume of the housing.

13. (Original) A system according to claim 12, wherein at least one module of the one or more sealed modules comprises a selected reagent.

14. (Original) A system according to claim 12, wherein at least one module of the one or more sealed modules comprises a lysing agent.

15. (Original) A system according to claim 12, wherein at least one module of the one or more sealed modules comprises an input port opening into a chamber within the module.

16. (Original) A system according to claim 12, wherein at least one module of the one or more sealed modules comprises:

a first chamber comprising a liquid located therein;

a second chamber comprising a selected reagent located therein; and

an inter-chamber seal isolating the second chamber from the first chamber within the at least one module.

17. (Original) A system according to claim 12, further comprising means for moving material within at least one module of the one or more sealed modules into the interior volume of the housing.

18. (Original) A system according to claim 12, wherein at least one module of the one or more sealed modules further comprises:

- an exit seal closing the exit port of the at least one module;

- a plunger located within the at least one module, wherein the plunger is movable from a loaded position in which the plunger is distal from the exit port to an unloaded position in which the plunger is proximate the exit port;

- wherein movement of the plunger towards the exit port opens the exit seal such that material from the at least one module exits through the exit port into the interior volume of the housing.

19. (Original) A system according to claim 18, further comprising an actuator operably coupled to the plunger of the at least one module comprising a plunger, wherein the actuator is capable of moving the plunger from the loaded position to the unloaded position.

20. (Original) A system according to claim 19, further comprising a fluid monitor operably connected to the housing, wherein liquid located within the interior volume of the housing can be sensed by the fluid monitor.

21. (Original) A system according to claim 20, further comprising a controller operably connected to the actuator and the fluid monitor, wherein the controller is capable of operating the actuator based on a signal from the fluid monitor.

22. (Original) A system according to claim 1, further comprising a module attached to the housing, wherein the module comprises:

- a module housing comprising an exit port and a sealed interior volume;

- an exit seal located over the exit port;

- a chamber located within the interior volume of the module housing, the chamber comprising one or more reagents located therein;

a plunger movable from a loaded position in which the plunger is distal from the exit port to an unloaded position in which the plunger is proximate the exit port; and

an input port in fluid communication with the chamber, wherein the input port enters the chamber between the plunger and the exit port when the plunger is in the loaded position;

wherein movement of the plunger towards the exit port opens the exit seal such that material from the interior volume of the module housing exits through the exit port into the interior volume of the housing.

23-47. (Canceled)

48. (New) A system according to claim 1, further comprising:

a vent that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere; and

a closure element operably attached to the vent, wherein the closure element is adhesively attached over the vent.

49. (New) A system according to claim 1, further comprising:

a vent opening that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere; and

a closure element operably attached over the vent opening, wherein the closure element is adjustable such that a size of the vent opening may be adjusted to at least one size between fully closed and fully open.

50. A system according to claim 49, wherein the vent opening comprises a plurality of openings.

51. (New) A system according to claim 1, wherein the system further comprises a sealed module comprising:

- an exit port attached to the housing through a module port that opens into the interior volume of the housing;

- a liquid contained within the sealed module;

- an exit seal closing the exit port of the module, wherein the liquid contained within the sealed module is isolated from the interior volume of the housing; and

- a plunger located within the sealed module, wherein the plunger is movable from a loaded position in which the plunger is distal from the exit port to an unloaded position in which the plunger is proximate the exit port;

- wherein movement of the plunger towards the exit port opens the exit seal such that material from the at least one module exits through the exit port into the interior volume of the housing.

52. (New) A system according to claim 51, wherein the plunger opens the exit seal by piercing or tearing.

53. (New) A system for detecting a target biological analyte, the system comprising:

- a surface acoustic wave sensor comprising a detection surface, wherein the surface acoustic wave sensor comprises a shear horizontal surface acoustic wave sensor;

- a capture agent located on the detection surface, wherein the capture agent is capable of selectively attaching the target biological analyte to the detection surface;

- a detection chamber located within an interior volume of a housing, the detection chamber comprising a volume defined by the detection surface and an opposing surface spaced apart from and facing the detection surface, wherein the opposing surface of the detection chamber comprises a flow front control feature, wherein the flow front control feature comprises discrete structures protruding from and separated by a land area on the opposing surface of the

detection chamber, and wherein the flow front control feature controls progression of a leading edge of a bolus of material moving across the detection surface;

a waste chamber located within the interior volume of the housing, the waste chamber in fluid communication with the detection chamber; and

a sealed module comprising:

an exit port attached to the housing through a module port that opens into the interior volume of the housing;

liquid contained within the sealed module;

an exit seal closing the exit port of the module, wherein the liquid contained within the sealed module is isolated from the interior volume of the housing; and

a plunger located within the sealed module, wherein the plunger is movable from a loaded position in which the plunger is distal from the exit port to an unloaded position in which the plunger is proximate the exit port;

wherein movement of the plunger towards the exit port opens the exit seal such that material from the at least one module exits through the exit port into the interior volume of the housing.

54. (New) A system according to claim 53, wherein the plunger opens the exit seal by piercing or tearing.

55. (New) A system according to claim 53, wherein the sealed module comprises:

a first chamber comprising a liquid located therein;

a second chamber comprising a selected reagent located therein; and

an inter-chamber seal isolating the second chamber from the first chamber within the sealed module.

56. (New) A system according to claim 53, further comprising:
a vent that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere; and
a closure element operably attached to the vent, wherein the closure element is adhesively attached over the vent.
57. (New) A system according to claim 53, further comprising:
a vent opening that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere; and
a closure element operably attached over the vent opening, wherein the closure element is adjustable such that a size of the vent opening may be adjusted to at least one size between fully closed and fully open.
58. (New) A system according to claim 57, wherein the vent opening comprises a plurality of openings.
59. (New) A system according to claim 53, wherein the flow front control feature comprises one or more channels in the opposing surface of detection chamber.
60. (New) A system according to claim 53, wherein the flow front control feature comprises one or more regions of hydrophobic material occupying a portion of the opposing surface and one or more regions of hydrophilic material occupying a portion of the opposing surface.
61. (New) A system according to claim 53, further comprising absorbent material located within the waste chamber.
62. (New) A system according to claim 53, wherein the system further comprises capillary structure located between the detection chamber and the waste chamber.

63. (New) A system according to claim 53, further comprising a vent that, when open, places the interior volume of the housing in fluid communication with ambient atmosphere.

64. (New) A system according to claim 63, further comprising a closure element operably attached to the vent.

65. (New) A system according to claim 53, further comprising a fluid monitor operably connected to the housing, wherein liquid located within the interior volume of the housing can be sensed by the fluid monitor.

66. (New) A system according to claim 53, further comprising a magnetic field generator capable of providing a magnetic field proximate to the detection surface.